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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/632,347	08/01/2003	William R. McGrath	50679/RAG/C766	3598

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EXAMINER

FLORY, CHRISTOPHER A

ART UNIT	PAPER NUMBER
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3762

DATE MAILED: 09/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/632,347

Applicant(s)

MCGRATH, WILLIAM R.

Examiner

Christopher A. Flory

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 April 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4,6,7,9,11,12 and 15-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,6,7,9,11,12 and 15-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 8/2/04, 2/9/05, 4/27/06.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application
- ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on 27 April 2006 was filed after the mailing date of the first Office action on 10 January 2006. The submission is in compliance with the provisions of 37 CFR 1.97 and the fee required under 37 CFR § 1.17(p) has been submitted. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Objections

2. Claim 12 is objected to because of the following informalities: it is improperly dependent on cancelled claim 10. Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. **Claims 1, 2, 4, 6, 7, 9, 11 and 12 stand rejected** under 35 U.S.C. 102(b) as being anticipated by Schmidt (US Patent 6,122,537, hereinafter Schmidt'537) for the arguments made of record and presented again below.

Schmidt'537 discloses oscillators, a transmitter & transmission antenna (Fig. 13, 2); a receiver and receiver antenna (Fig. 13, 4); a diode detector (Fig. 7) connected to

receiver antennae; one common transmitting/receiving antenna (col. 6, lines 47-48); an electromagnetic signal; monitoring of amplitude changes with respect to a beating heart (col. 5, lines 17-30); the heart rate of a test person with respiration stopped (Fig. 5); the spectrum of the heart signal reflected by a breathing person (Fig. 6); transmission of a frequency in the range of 100-MHz through 10-GHz (column 3, lines 64-65); wherein the said range can still be received through dense debris (column 2, lines 1-2); a low-pass filter and high-pass filter (Figs. 8a, 8b); and the application of digital signal processing (Fig. 3).

It is noted that the respiratory and heart rate movements disclosed in Schmidt'537 are considered to be indicative of time dependent variations in the complex impedance with respect to the electrical activity of the subject's heart, because the pulse (heart rate) is indeed indicative of a heart's movement and thus tied to the electrical activity of the heart. Therefore Schmidt'537 is considered to disclose a device which includes a detector configured to extract from the reflected signal beam variations in amplitude that are indicative of time dependent variations in the complex impedance with respect to the electrical activity of the heart.

Regarding claims 6 and 11, it is noted that Schmidt'537 discloses the monitoring of amplitude changes of a beating heart with respect to voltage, wherein voltage calculations are a result of Ohm's Law, $V=RI$, wherein with regard to oscillating signals (AC), impedance (Z) is commonly calculated in place of resistance (R), which would allow for the measurement of complex impedances with respect to a beating heart.

5. Claim 15 is rejected under 35 U.S.C. 102(b) as being anticipated by Schmidt'537.

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Regarding claim 15, Schmidt'537 discloses a remote-detection system wherein the source is configured to generate an electromagnetic signal beam at a predetermined frequency and the receiver is configured to filter the signal to remove noise as described in paragraph 4 above. Schmidt'537 also discloses amplifying the signal (Fig. 1, amplifier 8; column 7, lines 20-65).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schmidt'537.

Regarding claims 16 and 18, Schmidt'537 discloses the invention substantially as claimed including the ability to extract information related to the complex impedance of physiological function of a subject, but does not expressly disclose that the signal processing circuitry extracts/produces an electrocardiographic waveform from the reflected electromagnetic signal beam. However, as stated by Applicant, the ability of a device to be able to penetrate the chest wall (which, when trying to monitor the heart, could be considered debris or signal-blocking material) and reflecting signal from the surface of the heart is dependent only on the frequency of the transmitted electromagnetic signal, specifically citing 20GHz as a working value. Therefore, it

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would have been obvious to one of ordinary skill in the art at the time of the invention to use a signal frequency of 20GHz in order to provide sufficient energy in the signal to penetrate the surface of the patient's body and reflect signal from the patient's heart, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 17, Schmidt'537 discloses the invention substantially as claimed including an analog to digital converter (Fig. 1, A/D converter 9), but does not expressly disclose that the processor is a microprocessor. It is common knowledge in the art to use microprocessors in medical devices, particularly those employing A/D conversion, and therefore this limitation does not distinguish the instant application over the prior art.

Response to Arguments

8. Applicant's arguments filed 30 March 2006 have been fully considered but they are not persuasive. Applicant argues with respect to claims 1 and 9 that Schmidt'537 cannot anticipate the combination of a remote-detection system or method for monitoring changes in complex impedance associated with physiological activity of a subject where the detector extracts from the reflected signal beam variations in amplitude that are indicative of time dependent variations in the complex impedance of the illuminated portion of the subject. However, based on the arguments of record and those stated above, Examiner maintains that Schmidt'537 does in fact anticipated this combination, as respiratory and pulse information is indicative of time dependent

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variations in the complex impedance of the illuminated portion of the subject and, specifically regarding pulse information, the electrical activity of the heart. Therefore the rejection made under 35 U.S.C. 102(b) is deemed proper, and the claims still depending from these rejected base claims are also properly rejected.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Lemaitre (US Patent 6,031,482) discloses a method and system for sensing and locating a person, e.g. under an avalanche. Hablov (US Patent 5,448,501) discloses an electronic life detection system. Rostislavovich (US Patent 6,208,286) discloses a method for discovering the location of a living object and microwave location device for realizing the same. Li (US Patent 6,753,780) discloses a vehicle occupant detection system and method using radar motion sensor. Sharpe (US Patent 4,958,638) discloses a non-contact vital signs monitor. Cousy (US Patent 5,760,687) discloses a method of and device for detecting the presence of a living being of a particular species in a space monitored by a Doppler sensor.

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within

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TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher A. Flory whose telephone number is (571) 272-6820. The examiner can normally be reached on M - F 8:30 a.m. to 5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Angela Sykes can be reached on (571) 272-4955. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Christopher A. Flory

13 September 2006


George Manuel
Primary Examiner